REMARKS/ARGUMENTS

Claims 1-22 are active in this application.

Claims 8-19 stand withdrawn due to the imposed restriction.

Claim 20 provides the alternative dependency to claim 3 that has been removed from Claim 4.

Claim 21 defines another range of the DMA, which is supported in the specification on page 4, lines 17-18.

Claim 22 is supported in the specification on page 2, lines 14-19 and the Examples.

No new matter has been added.

As described in the specification on page 2, the inventors have discovered that when the particular monomer, N,N-dimethylacrylamide (DMA), is chosen in particular amounts, 2-7% by mass, they were able to ensure a uniform distribution and increased level of fluorescence intensity in each compartment of a microarray, i.e., higher hybridization efficiency.

In fact, the specification provides comparative data demonstrating the importance of (A) selecting the appropriate monomer and (B) selecting the appropriate concentration range.

Examples 1, 2 and 3 all provide DMA with concentrations within the range defined in the claims. Comparative Examples 1 and 2 use acrylamide as the polymerizable monomer in amounts falling within the range defined in the claims and Comparative Examples 3 and 4 use DMA but in concentrations outside the ranges defined in the claims. The results are shown in FIG. 1 and FIG. 2

FIG. 1

	Example 1	Comparative Example 1	Comparative Example 2
Spot intensity	5240963	1525464	1505942
Spot image			
Gel prepared from polymerization solution 1			
Gel prepared from polymerization solution 2			

This figure shows that in Example 1, uniform distribution of fluorescence intensity was achieved which was not achieved with acrylamide in Comp. Ex. 2. The distribution intensity was uniform in Comp. Ex. 1 but the fluorescence intensity was less than Ex. 1.

FIG. 2

	Example 2	Example 3	Comparative Example 3	Comparative Example 4
Spot intensity	20831	15595	11272	—
Spot image				
Gel prepared from polymerization solution 1				No gel
Gel prepared from polymerization solution 2				No gel

This figure shows that in Examples 2 and 3, uniform distribution of fluorescence intensity was achieved which was not achieved whereas in Comp. Ex. 3 using higher than 7% by mass of DMA, the fluorescence intensity was lower than in Example 2, and the fluorescence intensity in the hollow space was high in the peripheral region, but low in the center region. Further with Ex. 4 using less than 2% by mass of DMA, the sliced chip did not hold any gel and its hollow spaces were not filled

That the double selection of DMA in the concentration of DMA provided the needed uniformity of fluorescence could not have been reasonably predictable from what is described in the cited art, particular, as the cited art emphasizes concentrations outside that which is claimed and do not emphasize the importance of DMA as the polymerizable monomer.

To the Timofeev rejection.

As already noted in the Action, Timofeev does not teach that DMA is present at a concentration of 2% to 7% and the cross-agent at 0.1% to 1 .5%. Timofeev describes 8.9 % by wt of DMA (0.9 M and the molecular weight of DMA is 99.133).

As already discussed above and shown in the Examples of the specification, a biological substance-immobilized gel containing DMA in an amount of 1% or 8% does not provide the technical advantages associated with a gel containing 2% to 7% DMA.

Specifically, a gel containing 1% DMA lacks stability in that it is difficult to retain the gel in the hollow part of a hollow fiber. Therefore, such a gel cannot hybridize with target substances in a microarray.

Further, a gel-forming monomer containing DMA in an amount of 8% generates air bubbles during gel formation, which leads to voids in the gel. This gel is not effective at immobilizing biological substances in or on the gel and leads to non-uniform fluorescent patterns (see FIG. 2).

That the selection of DMA in the concentration of DMA provided the needed uniformity of fluorescence could not have been reasonably predictable from what is described in Timofeev, particularly, as Timofeev emphasizes concentrations outside that which is claimed and provide no indication that this is simply a result-oriented optimization of known variables. Indeed, the uniformity achieved is different-in-kind to the lack of uniformity shown in the Comparative Examples.

Therefore, withdrawal of the Timofeev rejection is requested.

To the Akita rejection.

Akita describes DMA only as an example of monomer (a) for forming a gel on the inner wall of a fiber to improve retention of the gel within the fiber (see paragraph [0132] and [0140]) rather than to improve the hybridization and fluorescence properties of the gel. Further, Akita et al. teaches that the concentration of monomer (a) in the gel-forming solution is preferably 80% or less and more preferably 1.50% (see paragraph [0144]). The specific Examples of such gels use DMA in amounts of 10, 19, 38 wt.% (Examples 46-51). Thus, Akita et al. contains a general disclosure of the amount of DMA in a biological substance-immobilized gel which is far broader than the 2% to 7% range claimed in Claim 1. Consequently, there can be no inference that the disclosure of gels containing DMA in Akita would lead the skilled person to the selected sub-range of 2% to 7% with a reasonable expectation of the significant and improved results achieved as shown in the aforementioned Examples.

Withdrawal of the rejection based on Akita is requested.

A Notice of Allowance is also requested.

Respectfully submitted,

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